MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2018/2019

TCP3151 – INTEGRATIVE PROGRAMMING AND TECHNOLOGIES

(All sections / Groups)

23 October 2018
9.00AM – 11.00AM
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of 7 pages excluding the cover page.
2. Attempt all FIVE questions.
3. All questions carry equal marks and the distribution of the marks for each question is given.
4. Please write your answers in the Answer Booklet provided.

QUESTION 1 (10 MARKS)

a) Define the term of compilation. List **TWO** (2) examples of lower-level machine.

(3 marks)

b) Multitier client-server architecture can be formed by adding extra servers into the three-tier client-server model. List **FOUR** (4) advantages of using the multitier client-server architecture.

(4 marks)

c) COM (Component Object Model) is a Microsoft specification that defines the interaction between components in the Windows environment. COM provides the services by performing the necessary steps to make the call. Define **THREE** (3) type of servers that used by COM to make a call.

(3 marks)

Continued...

QUESTION 2 (10 MARKS)

a) Both native and hybrid mobile app are running in the mobile devices. State **FOUR** (4) differences between native mobile app and hybrid mobile app.

(4 marks)

b) You are helping your boss to setup a new company to manage the increasing worldwide operations. Your boss plan to use centralized system in the new company. You try to persuade your boss to install the distributed system in the new company. List **FOUR** (4) advantages of using the distributed system that will help your boss to change his decision.

(4 marks)

c) Web service is a method that enables the communication between client and server applications on the World Wide Web. List **TWO** (2) examples of web service.

(2 marks)

Continued...

QUESTION 3 (10 MARKS)

a) You are required to write a well-formed XML document based on the information given below.

"Thumb drive with item code of 001 is supplied by Mr. Yeo from ABC Sdn. Bhd. in quantity of 300 on June 2017".

You are freely to name the tag element where the name of the tag element must follow the standard naming rule.

(4 marks)

b) A weather report has:

- The name of the weather report is a root element.
- It has three sub elements: date, location, temperature.
- Location has two sub elements: state and country
- Temperature has attribute of remark

Write a suitable DTD in defining the weather report based on the above format.

(4 marks)

c) XML attributes are used to describe the XML elements, or to provide additional information about the elements. State **TWO** (2) characteristics of attributes.

(2 marks)

Continued...

QUESTION 4 (10 MARKS)

a) XML provides flexibility in storing data and the data is able to be transformed to several types of format. In view of this, you are requested by your team leader to display the content of XML in a table form. Construct the table that matches with the data in the XML document below.

```
<?xml version="1.0" encoding="UTF-8"?>
<photo>
  <event>birthday party</event>
  <person>Alice Yap</person>
  <taken year="2018" month="3" date="2" />
  <time>13:45</time>
  <place>Melaka</place>
</photo>
```

(3 marks)

b) You are a XML designer in company ABC. Recently, your colleague is instructed to design XML of data management system of your company. How to ensure the XML designed by your colleague is well-formed?

(3 marks)

c) Given the XML document and HTML output, fill in the XSLT code to produce the HTML output.

XML document:

```
<?xml version="1.0"?>
<report>
   <lego code="31033">
      <type>Creator</type>
      <piece>250</piece>
   </lego>
   <lego code="41108">
      <type>Friends</type>
      <piece>670</piece>
   </lego>
</report>
```

HTML output:

```
<html>
   <body>
      <p>Creator</p>
      <p>250</p>
      <p>Friends</p>
      <p>670</p>
   </body>
</html>
```

Continued...

```
<?xml version="1.0"?>
  <xsl:stylesheet version="1.0" xmlns:xsl="http://www.w3.org/1999/XSL/Transform">
    <xsl:output method="html"/>
    <xsl:template match="/">
      <html>
       <body>

        <!-- Write your code here -->

       </body>
      </html>
    </xsl:template>
  </xsl:stylesheet>
```

(4 marks)

Continued...

QUESTION 5 (10 MARKS)

a) You are an instructor to teach the course of Java Native Interface (JNI). In JNI, native function is implemented in C file where two arguments (JNIEnv* and jobject) are involved. Explain the usage of these two arguments to your student.

(3 marks)

b) As a senior Java programmer, you are leading a team of junior programmers to design a system involved the use of JNI programming language. One of the team members does not clear on the use of integer array in JNI. As a team leader, you are responsible to provide TWO methods to access the integer array in JNI to the team member. Also, you must give related function from each method to guide the team member.

(4 marks)

c) Given the code of Test.java and incomplete code of CTest.c. Fill in the empty portion of code CTest.c.

(3 marks)

```
// Test.java
class Test{
   private native int call();

   private void callback(){
      System.out.println("Calling from Java");
   }
   private int callnum(){
      return 668;
   }
   public static void main (String args[]){
      Test p = new Test();
      System.out.println("The value is " + p.call());
   }

   static {
      System.loadLibrary("CTest");
   }
}
```

Continued...

```
// CTest.c
#include <jni.h>
#include <stdio.h>

JNIEXPORT jint JNICALL Java_Test_call (JNIEnv *env, jobject obj){

   jclass cls = (*env)->GetObjectClass(env, obj);
   jmethodID mid1 = (*env)->GetMethodID(env, cls, "callback", "()V");
   jmethodID mid2 = (*env)->GetMethodID(env, cls, "callnum", "()I");

  if ((mid1 == NULL ) || (mid2 == NULL))    return 0;
  printf("Calling from native code\n");

  // write your code here

}
```

End of Paper